PATENT APPLICATION
Docket No.: 10237.28

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	
Sachin Govind Deshpande	
Serial No.: 10/757,102	Art Unit
Filing Date: January 14, 2004	2152
Title: SYSTEMS AND METHODS FOR PROVIDING A DISCOVERY PROTOCOL	Conf. No. 2922
Examining Attorney: Tariq S. Najee-Ullah	

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

DECLARATION UNDER 37 C.F.R. § 1.131

I the undersigned, declare that:

1.   I am the named inventor of the above-referenced patent application.

2.   I was personally and materially involved in all events discussed herein, and have personal

knowledge of the facts set forth below.

3.   I conceived the invention disclosed in the above-referenced patent application in June

2002 and prepared a disclosure document disclosing the invention that was signed by two

witnesses on July 16, 2002. Attached at Exhibit A is a true, redacted copy of the invention

disclosure prepared by me. Ex. A.

4.   It is my understanding that my invention disclosure for the above-referenced patent

application was sent to Kirton & McConkie for preparation of a patent application in August

2003 along with two other invention disclosures for preparation of two additional patent

applications. All three disclosures named me as at least one of the named inventors. The other

two disclosures resulted in patent application serial numbers 10/712,241 filed on November 13,

2003 and 10/738,475 filed on December 17, 2003.

5.   I diligently participated in the preparation, review, and revision process for all three

applications during the time period between when the three disclosures were sent to Kirton &

McConkie in August 2003 and the date the above-referenced patent application, serial number

10/757,102, was filed on January 14, 2004. During this time period, I also attended to my

normal work duties.

6.   Work on the three patent applications progressed in serial fashion, and the preparation,

review, and revision process was completed first for application serial number 10/712,241 in

November 2003. The preparation, review, and revision process was completed second in

December 2003 for application serial number 10/738,475. The preparation, review, and revision

process was completed for the instant application last in January 2004.

7.   The above-referenced application was the last application to be completed, and was filed

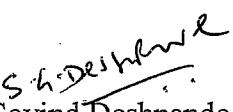on January 14, 2004, as soon as the review and approval process was completed.

8.   From the time the invention disclosure was provided to Kirton & McConkie to the date of

filing of the above-referenced application, I diligently participated in the preparation, review, and

revision process and sought to assist in filing the patent applications as soon as possible within the time constraints of my then-existing work duties.

9.   All statements made of my own knowledge are true and all statements made on information and belief are believed to be true; and, further, that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code, and that such willful, false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated this __20__ day of October, 2008.

Respectfully Submitted,

Sachin Govind Deshpande

ADS
1095060

Exhibit A

Redacted patent disclosure document

SLA Patent Evaluation System

Title: Aquos Discovery Protocol	
SLA No. (If available) /252	Inventor(s) Sachin Deshpande

1 **Technical and Marketing Evaluation**

Redacted

II. Evaluation of Patent contribution to Transferable Technology (Select 1 Only)

Redacted

1.   Descriptive   Aquos Discovery Protocol
       Title
  of Invention:

2.   Inventor(s):

Full Name: Sachin   Govind   Deshpande
                    _____   _____   _____
                        First   Middle   Last

Address: 16900 SE, 26ᵗʰ Dr.   Vancouver   WA   98683   Clark
                    #T131
                _____   _____   _____ _____ _____
                    Street   City   State   Zip   County

Citizenship: India
                _____

Telephone: 360-944-0731   360-817-8486
                _____   _____
                    Home   Company

Inventor(s):
Full Name:
                _____   _____   _____
                    First   Middle   Last

Address:
                _____   _____   _____ _____ _____
                    Street   City   State   Zip   County
Citizenship:
                _____

Telephone:
                _____   _____
                    Home   Company

Inventor(s):
Full Name:
                _____   _____   _____
                    First   Middle   Last

Address:
                _____   _____   _____ _____ _____
                    Street   City   State   Zip   County

Citizenship:
                _____

Telephone:
                _____   _____
                    Home   Company

Supervisor's Acknowledgment: "I believe this disclosure is novel and complete and should be submitted to the Patent Review Committee."

Supervisor's Signature: _____

Date: 7/19/2002

Supporting Group   ☐ CRDG   ☑ AVSG   ☐ CSG   ☐ ISG   ☐ DSG

☐ ICG   ☐ LCDG   ☐ Other:

S. G. Deshpande	7/16/2002		
Inventor Signature	Date		
		John Weller	7/16/02
Inventor Signature	Date	Witnessed & Understood By	Date
		Edwin G. Brown	7/16/02
Inventor Signature	Date	Witnessed & Understood By	Date

JUL 29 2002

3.   Project & Supervisor:

Supervisor's Name: _____ Dr. Shawmin Lei _____

Supervisor's Title: _____ Manager, Image coding and communications _____

Project Number/Name: _____ Open Aquos _____

4.   Conception of the Invention:

Date Conceived: _____ 6/3/02 _____

Date of first Written Description: _____ 6/3/02 _____

Notebook & Page No. or File Archive: _____ M:\sachind\openaquos\docs\adp.doc _____

Date first explained to others (whom?): _____

Planned Application for the Invention: _____ Open Aquos _____

5.   Construction & Test of First Prototype Embodying the Invention:

Date First Prototype Completed: _____

Part Number/Product Description: _____

Date of First Successful Test: _____

Successful Operation Witnessed By: _____

6.   Public Disclosure of Invention (Presentation at public meeting or publication) (NOTE: Patent Application MUST be filed prior to any public disclosure.):

Date of First Public Disclosure: _____

Setting (Conference/Journal Name): _____

Title of Paper or Presentation: _____

Type of Disclosure (Written/Verbal): _____

Does Data Sheet or Application Note Disclose the Invention (when)? _____

7.   What is the field of the invention (Invention relates to...):

The invention relates to a discovery protocol, which would allow a PC and Aquos TV
to discover each other on a home network.

8.   What is the problem solved by your invention? How is it solved in the prior art (do not put search pages here)?

We define a protocol which allows a home PC to discover Aquos TV or the Aquos TV to
discover home PC. The Aquos Discovery Protocol is lightweight and has support for versioning.

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Inventor Signature	Date			
		Kim Kelln	7/16/02	
Inventor Signature	Date	Witnessed & Understood By	Date	
		Edwin G. Brown	7/16/02	
Inventor Signature	Date	Witnessed & Understood By	Date	

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In the prior art, a variety of discovery protocols have been defined. This includes the salutation protocol, service location protocol (SLP), Sun's JINI protocol, Universal plug and play (UpnP) and simple service discovery protocol (SSDP).

9. How is your solution different from the prior art (one paragraph or list)?

Majority of the currently existing protocols are heavyweight protocols. The proposed protocol is lightweight. We use a unique combination of UDP broadcast request and Unicast reply transaction for the discovery. We provide support for versioning, which will allow the Aquos TV to only accept and make connections to a correct version of Home PC. We have provision to handle responses from multiple PCs.

In the prior art, the salutation protocol defines an abstract model with three components: Client, Server, and Salutation Manager (SLM). Salutation defines its protocol based on SunRPC. The service location protocol (SLP) defines an abstract architecture consisting of "User Agents" (UA) (clients), "Service Agents" (SA) (services) and "Directory Agents" (DA) (directories). Sun's JINI protocol is largely defined as exchanges of serialized Java objects, mostly via Java Remote Method Invocation (RMI). UPnP is a Microsoft standard for spontaneous configuration. UPnP handles network address resolution, and coupled with the IETF proposal Simple Service Discovery Protocol (SSDP) it provides higher level service discovery. UPnP has a similar architecture to Salutation and SLP.

10. Please give a detailed description of your invention, include any graphics, notebook pages or other material necessary to understand your invention.

Here is a brief description of our proposed protocol:
In the following we use the term client to refer to Aquos TV and the term server to refer to Home PC.

The client broadcasts on UDP on the local network, a OA_NW_REQUEST message to discover the server. The server send a unicast reply OA_NW_REPLY on UDP to the client. The OA_NW_REPLY message contains information about the server IP address and TCP port where client can make a connection. Each message consists of a random Identifier (RID), which is same for the request-response transaction. This RID is used to identify a message transaction request-response pair. A possible message structure for Request and Response messages is shown below, using pseudo-code.

OA_NW_REQUEST message structure:

```
rid=generateRID();  // function to  generate random ID for this
```

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		Jim Nell	_7/../../.._
Inventor Signature	Date	Witnessed & Understood By	Date
		Edwin G. Brown	_7/16/02_
Inventor Signature	Date	Witnessed & Understood By	Date

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```
                        //message

packet[0]=((rid & 0xff000000)>>24);
packet[1]=((rid & 0x00ff0000)>>16);
packet[2]=((rid & 0x0000ff00)>>8);
packet[3]=((rid & 0x000000ff));
packet[4]=OA_NW_REQUEST;
packet[5]=OA_START_NUMBER_HOPS;
packet[6]=OA_NW_CLIENT_VERSION;
packet[7]=OA_NWREQUEST_PAYLOADLENGTH;
```

OA_NW_REPLY message structure:

```
rid=getOANWREUESTRID(); // function to retrieve RID from the
                        // client OANWREQUEST message

packet[0]=((rid & 0xff000000)>>24);
packet[1]=((rid & 0x00ff0000)>>16);
packet[2]=((rid & 0x0000ff00)>>8);
packet[3]=((rid & 0x000000ff));
packet[4]=OA_NW_REPLY;
packet[5]=OA_START_NUMBER_HOPS;
packet[6]=OA_NW_SERVER_VERSION;
packet[7]=OA_NWREPLY_PAYLOADLENGTH;
packet[8]=((OA_NW_TCP_LISTEN_PORT & 0x0000ff00)>>8);
packet[9]=((OA_NW_TCP_LISTEN_PORT & 0x000000ff));
```

A client may receive multiple OA_NW_REPLY messages (from multiple servers) for its OA_NW_RESPONSE message. The client will make a decision to choose a particular server for connection. This may be based on the server version (OA_NW_SERVER_VERSION). Alternately the client may choose to connect to the first server from which OA_NW_REPLY is obtained. Some other strategy may also be used.

The client follows a retransmission algorithm for sending OA_NW_REQUEST. The retransmission algorithm uses a randomized exponential backoff strategy. This helps to reduce the network traffic. The user is given a status indication while the client tries to locate the server. The user is prompted to start the server (Home PC) if no discovery is made after N retransmissions. Reliable protocol (TCP/IP) is used for server-client connection after the initial discovery. A pesudo-code illustrating the exponential backoff strategy is shown below.

```
private DatagramSocket mySocket;
```

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Inventor Signature	Date	Witnessed & Understood By	Date
		Edwin G. Brown	_7/16/02_
Inventor Signature	Date	Witnessed & Understood By	Date

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```
private DatagramPacket myPacket;
private static final int sendPort=10088;
private static final int INITIAL_SLEEP_DURATION=1000;
private static final int nTransmissions=10;
private int attemptNumber=1;
private int sleepDuration=INITIAL_SLEEP_DURATION;
private double scaleFactor=1.5;

try {
    mySocket = new DatagramSocket();
    }
    catch( SocketException Se ) {
      Se.printStackTrace();
    }
myPacket = new DatagramPacket( packet , packet.length,
        InetAddress.getByName( "255.255.255.255" ), sendPort);

while(dp.bLocatedServer!=true)
{
    mySocket.send( myPacket ); //mySocket is
    System.out.println("Locating server : attempt
    "+attemptNumber);
    try {
                                    Thread.sleep(sleepDuration);
    }catch(InterruptedException Ie){} attemptNumber++;
    sleepDuration=(int)(sleepDuration*scaleFactor);
    if((attemptNumber%(nTransmissions+1))==0)
    {
    System.out.println("Could not locate server. \nPlease make
    sure your home PC is turned on \nand Aquos network card is
    installed on the PC.");

    sleepDuration= INITIAL_SLEEP_DURATION;

    }
}
```
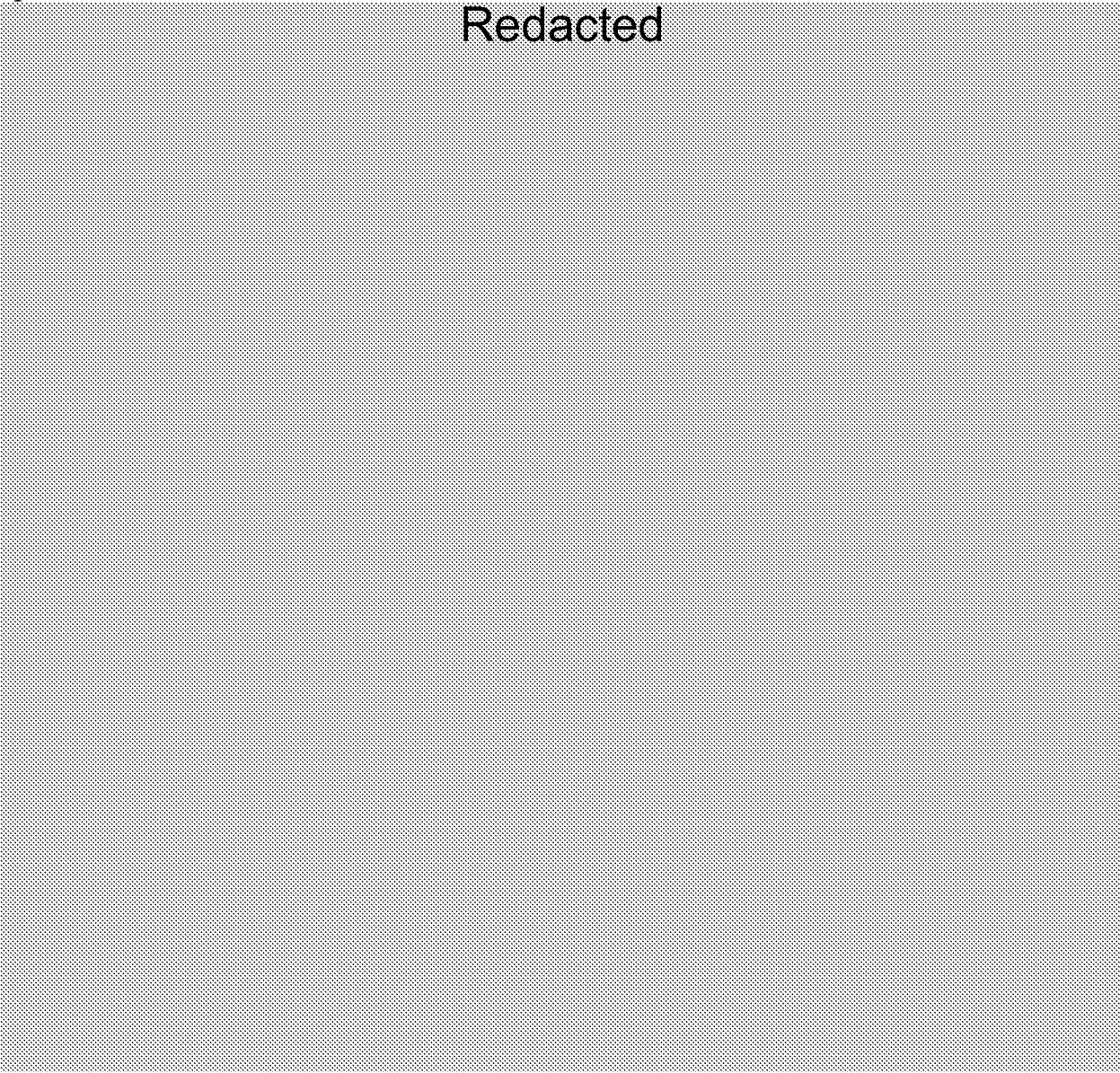
The client and server are both capable of handling a network disconnect. Essentially the intial discovery protocol is repeated after and network disconnect.

11. What other embodiments or examples are there of your invention?

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The proposed protocol can be used for as a simple discovery protocol for N devices in peer to peer as well as server client mode.

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Inventor Signature	Date	Witnessed & Understood By	Date
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